

REMARKS

I. Introduction

With the addition of claim 8, claims 1 to 8 are pending in the present application. In view of the foregoing amendments and following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Summary of Interview

Applicants thank the Examiner for the courtesies extended to Applicants' representative during the course of a telephone interview of February 4, 2005.

During the course of the telephone interview, no exhibit was shown and no demonstration was conducted.

During the course of the telephone interview, claims 1 and 4 were discussed.

During the course of the telephone interview, U.S. Patent No. 5,652,039 to Tremain et al. and Japanese Published Application No. 59-24636 ("Hieda et al.") were discussed.

During the course of the telephone interview, Applicants argued with respect to claim 1 that the combination of Hieda et al. Tremain et al. do not disclose, or even suggest, inserting a bending element into the workpiece at least up to plasticization.

Applicants suggested amending claim 1 to recite moving the bending element out of the workpiece after the bending step. Applicants argued that even if Tremain et al. suggest using a bending element during the bending process, the combination of Tremain et al. and Hieda et al. does not disclose, or even suggest, any details regarding what to do with the bending element during or after the bending step. Further, Applicants argued that Hieda et al. in effect teach away from a combination with Tremain et al. given that the workpiece in Hieda et al. cannot be bent about a bending element and still result in the final product shown in Figure 4.

During the course of the telephone interview, the Examiner indicated that claim 1, amended as suggested by Applicants, would likely be allowed. The Examiner also indicated that claim 4, if amended so as to be placed in independent form, would also likely be allowed. The Examiner further indicated that a new claim similar to claim 1 but including the limitation "moving the bending element out of the workpiece after the bending step while further bending the workpiece to seal a gap that was created in the workpiece by the bending element in the inserting step and such that lateral sides of the workpiece to either side of the gap are guided together behind the bending element moving out of the workpiece" would also likely be allowed.

III. Rejection of Claims 1 to 5 Under 35 U.S.C. § 103(a)

Claims 1 to 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Hieda et al. and Tremain et al. Applicants respectfully submit that claims 1 to 5 are allowable for the following reasons.

Claim 1 relates to a method for bending a substantially plate-shaped, thermoplastic workpiece. Claim 1 recites bending the bending region about the bending element acting on the workpiece about a front end, relative to an insertion direction, of the inserted bending element. Claim 1 has been amended herein without prejudice to recite moving the bending element out of the workpiece after the bending step. Support for this amendment may be found, for example, in original claim 4. Claim 4 has been amended so as to be placed in independent form.

Hieda et al. purportedly relate to a working method including a bar heater for a cushioning and insulating material. A bar heater is stated to be heat pressed into a sheet-like thermoplastic foamed resin material from its surface towards its back in order to form a V-like groove in the sheet-like foamed resin material. The sheet-like foamed resin material is stated to be bent at the center line of the groove so as to fuse both the walls of the groove together. See p. 2, lines 13 to 20 of English translation of Hieda et al.

Tremain et al. purportedly relate to a sandwich panel for angular forming. The panel is stated to be formed at room temperature using standard metal fabrication equipment and techniques. See col. 2, lines 48 to 50. The edge 9 of a forming tool, as illustrated in Figure 2, is stated to be used to form a hinge or fold line along the contact line of the forming tool via a cold forming process. See col. 5, lines 40 to 52.

Nowhere does the combination of Hieda et al. and Tremain et al. disclose, or even suggest, bending a bending region about a bending element acting on a workpiece about a front end, relative to an insertion direction, of an inserted bending element, as recited in claims 1 and 4. The Final Office Action admits that neither Hieda et al. nor Tremain et al. directly discloses bending the workpiece about a bending element.

Further, Applicants respectfully submit that nowhere does the combination of Hieda et al. and Tremain et al. disclose, or even suggest, moving the bending element out of the workpiece after the bending step, as recited in claims 1 and 4, as amended. As detailed below, Applicants respectfully submit that Tremain et al. do not disclose, or even suggest, bending the workpiece about a bending element. Even if Tremain et al. do suggest bending the workpiece about a bending element, however, nowhere do Tremain et al. disclose, or even suggest, what to do with the bending element during or after the bending step or how long to leave the bending element in the workpiece. Therefore, Applicants respectfully submit that the combination of Hieda et al. and Tremain et al. do not disclose, or even suggest, moving the bending element out of the workpiece after the bending step, as recited in claims 1 and 4, as amended.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). As stated above, the combination of Hieda et al. and Tremain et al. fails to disclose, or even suggest, each and every feature of claims 1 and 4. It is therefore respectfully submitted that the combination of Hieda et al. and Tremain et al. does not render obvious claims 1 and 4.

The Final Office Action admits that Hieda et al. do not disclose bending a bending region about a bending element acting on a workpiece about a front end, relative to an insertion direction, of an inserted bending element, as recited in claims 1 and 4. The Final Office Action relies on Tremain et al. to allegedly remedy the admitted deficiency of Hieda et al. The Final Office Action alleges that Tremain et al. disclose bending a sandwich panel at a hinge or fold with or without assistance of a forming tool 5. Applicants respectfully disagree. The Final Office Action refers to col. 5, lines 40 to 67, which state in relevant part as follows:

Once the fold is initiated in this way, it will propagate in an entirely progressive and predictable manner provided sufficient bending moment is applied, with or without the assistance of the forming tool.

However, this reference in no manner positively discloses bending the sandwich panel at a hinge or fold with the assistance of the forming tool, as alleged by the Final Office Action. Rather, the cited portion merely discusses details relating to the propagation of the fold, *i.e.*, the cited portion describes that once the hinge is formed the presence of the forming tool will not affect the propagation of the fold. This is not the same as disclosing, or even suggesting, that the forming tool should be left in place and the panel should be bent with the assistance of the forming tool.

The Final Office Action admits that Tremain et al. do not specifically disclose bending with the assistance of a forming tool but asserts that Tremain et al. suggest that a forming tool could be used to assist in the bending operation without adversely affecting the bending of the sandwich panel. As such, the Final Office Action further asserts, Tremain et al. establish that it would have been *prima facie* obvious to use a forming tool to assist in the bending operation of Hieda et al. and that one of ordinary skill in the art would have

recognized that a forming tool could beneficially be used to assist in the bending operation of Hieda et al.

Applicants respectfully submit that the Examiner is incorrectly reading certain features into Tremain et al. Respectfully, just because the bending tool would not interfere with the propagation of the fold, as indicated by Tremain et al., in no manner establishes that it would "assist in the bending operation" or "beneficially be used to assist in the bending operation of Hieda et al.," as alleged in the Final Office Action. As per the discussion on pages 3 to 4 of Hieda et al. and as one skilled in the relevant art would recognize, even small parameter changes, such as the angle at the head of the bending element, may significantly affect the quality of the panel product. Consistently, the above-referenced statement that the presence of the bending element would not interfere with propagation of the fold in no manner suggests that it would not cause other problems with the end product. Further, this statement in no manner provides a suggestion or motivation for bending about the bending element. Applicants respectfully submit that merely stating that the presence of the bending element may not cause a certain problem in no manner provides a motivation for bending about the bending element. Nowhere do Hieda et al. in any manner indicate a potential benefit of bending about the bending element. To the contrary, Tremain et al. specifically point out, with respect to fold formation, the presence of the forming tool in no manner makes a difference in the final product. See col. 5, lines 53 to 56. In this regard, the Final Office Action alleges that one of ordinary skill in the art would have recognized that bending about the bending element would be beneficial. Applicants respectfully traverse these contentions to the extent that they are maintained and requests that the Examiner provide specific evidence to establish those assertions and/or contentions under 37 C.F.R. § 1.104(d)(2) or otherwise. In particular, it is respectfully requested that the Examiner provide an affidavit and/or that the Examiner provide published information concerning these assertions. This is because this rejection is apparently being based on assertions that draw on facts within the personal knowledge of the Examiner, since no support was provided for these otherwise conclusory and unsupported assertions. (*See also* M.P.E.P. § 2144.03).

The Final Office Action's allegation that it would have been obvious to one of ordinary skill in the art to bend a sandwich panel about the bending element in the process of Hieda et al. as described by Tremain et al. to provide more accurate and reliable bending and to provide a product having extended utility is completely unsupported. Applicants submit that the above allegations are completely unsupported and are based on Applicants' own application. Specifically, Applicants' Specification states the following:

Because of the bending about the bending element pushed into the workpiece, the apex of the flexure is closer to the outside of the bending region, whereby, in comparison to the total thickness of the workpiece, a narrow region is subjected to stretching. Because of that, the stretching acting on this region

is also less. This is especially true for the outer side of the bending region.

Specification at p. 2, lines 22 to 28. None of the patents or printed publications relied upon mention or refer to the motivation alleged in the Final Office Action for making the proposed combination.

The apparent reliance on Applicants' Specification makes plain that the present rejection is based on nothing more than impermissible hindsight.

Therefore, the combination of Hieda et al. and Tremain et al. in no manner provides a suggestion or motivation to bend a sandwich panel about a bending element for any type of enhanced product utility or performance, as alleged by the Final Office Action.

Applicants further respectfully submit that Hieda et al. in effect teach away from a combination with Tremain et al., to the extent that Tremain et al. disclose, or suggest, bending about a bending element. As can be seen in Figures 1 to 4 of Hieda et al., the bar heater is pressed almost all the way through the thermoplastic foamed resin material from its surface towards its back to form a V-like groove in the material. See also p. 2, lines 13 to 18. Applicants submit that it would be clear to one skilled in the art that if the thermoplastic foamed resin material of Hieda et al. was bent about the bar heater the bending process would change the slot shaped by the initial impression of the bar heater. Hieda et al. state that extensive research was conducted with respect to the bar heater shape, and thus the shape of the slot ultimately formed by the bar heater, such that walls of the slot in a molten state become fused in an ideal manner. See p. 3, line 22 to p. 4, line 8. Therefore, given that Hieda et al. disclose the importance of a specific slot shape and given that bending about a bar heater would not result in the ideal shape disclosed by Hieda et al., Applicants respectfully submit that Hieda et al. effectively teach away from a combination with Tremain et al. Applicants further submit that one skilled in the art would recognize that, given the small thickness of material at the vertex of the joint, leaving the heating element in the thermoplastic foamed resin material of Hieda et al., which has a relatively large width compared to the thickness of the thermoplastic foamed resin material, may in fact lead to complete failure of the material at the joint by subjecting this thin portion of the thermoplastic foamed resin material to tension during bending.

In view of all of the foregoing, it is respectfully submitted that the combination of Hieda et al. and Tremain et al. does not render unpatentable claims 1 and 4.

Claims 2, 3 and 5 depend from claim 1 and therefore include all of the limitations of claim 1. Therefore, it is respectfully submitted that these dependent claims are patentable over the combination of Hieda et al. and Tremain et al. for at least the same reasons provided above in support of the patentability of claim 1. *In re Fine, supra* (any dependent claim that depends from a non-obvious independent claim is non-obvious).

IV. New Claim 8

New claim 8 has been added herein. It is respectfully submitted that claim 8 adds no new matter and is fully supported by the present application, including the Specification. Applicant respectfully submits that new claim 8 is patentable over the references relied upon for at least the same reasons submitted above in support of the patentability of claim 1. Applicants further respectfully submit that the combination of Hieda et al. and Tremain et al. does not disclose, or even suggest, moving the bending element out of the workpiece after the bending step while further bending the workpiece so as to seal a gap that was created in the workpiece by the bending element in the inserting step and such that lateral sides of the workpiece to either side of the gap are guided together behind the bending element moving out of the workpiece. As indicated above, Applicants respectfully submit that the combination of Hieda et al. and Tremain et al. does not disclose, or even suggest, bending the workpiece about the bending element, let alone further bending the workpiece behind the flat bar moving out of the workpiece.

V. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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